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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/059,149	01/31/2002	Koji Nakamura	OKI.296	5981

7590 06/28/2004

VOLENTINE FRANCOS, PLLC
Suite 150
12200 Sunrise Vally Drive
Reston, VA 20191

EXAMINER	
LOUIE, WAI SING	
ART UNIT	**PAPER NUMBER**
2814	

DATE MAILED: 06/28/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/059,149	NAKAMURA, KOJI	
	Examin r	Art Unit	
	Wai-Sing Louie	2814	

-- The MAILING DATE of this communication appears on th cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 April 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-19* is/are pending in the application.

4a) Of the above claim(s) *1-8* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *9-19* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *1/31/02*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 9, 12, 14, and 18 are rejected under 35 U.S.C. 102(e) as being anticipated by Mannou et al. (US 6,590,918).

With regard to claim 9, Mannou et al. disclose a semiconductor laser device (col. 9, line 17 to col. 26, line 39 and fig. 1a) comprising the steps of:

- Forming a light absorption layer 103 on a compound semiconductor substrate 101 (col. 9, lines 26-27 and fig. 1a);
- Forming a compound semiconductor layer 106 on the light absorption layer 103 (col. 9, lines 30-31 and fig. 1a);
- Selectively etching the compound semiconductor layer 106 for forming a ridge part (col. 9, lines 42-43);
    - Where impurity includes in the compound semiconductor layer is selectively diffused on the light absorption layer 103 (col. 10, lines 10-18).

With regard to claim 12, Mannou et al. disclose the impurity is zinc (col. 9, line 47).

With regard to claim 14, Mannou et al. disclose the compound semiconductor structure is formed on a GaAs substrate (col. 9, line 27).

With regard to claim 18, Mannou et al. disclose the compound semiconductor layer is a P-AlInGaP clad layer 106 and a contact layer 110 is formed on the clad layer 106 (fig. 1a).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 10-11 and 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mannou et al. (US 6,590,918) in view of Kunisato et al. (US 5,990,496).

With regard to claim 10, Mannou et al. do not disclose a selectively impurity diffusion step includes forming an undoped compound semiconductor layer on the light absorption layer 103 to selectively diffuse impurity on the light absorption layer 103 while diffusion of impurity from the compound semiconductor layer 106 is suppressed by the undoped compound semiconductor layer. However, Kunisato et al. disclose an undoped cap layer 37 on the active layer 36 (Kunisato col. 10, lines 20-21). Kunisato et al. teach the undoped cap layer does not allow undesirable impurity diffusion from the cap layer side into the active layer and this sufficiently suppresses luminous intensity deterioration due to undesirable impurity diffusion

(Kunisato col. 2, lines 50-54). Therefore, it would have been obvious at the time the invention was made to modify Mannou's device with the teaching of Kunisato et al. to provide an undoped compound semiconductor layer on the light absorption layer 103 to selectively diffuse impurity onto the light absorption layer 103 in order to suppress the undesirable impurity diffusion.

With regard to claim 11, Mannou et al. modified by Kunisato et al. in claim 10 above would disclose the undoped compound semiconductor layer is formed on the light absorption layer 103, which locates at both ends at an area 111 to be made into the ridge part (Mannou fig. 1a).

With regard to claim 15, Mannou et al. modified by Kunisato et al. in claim 10 above would disclose the compound semiconductor structure is selectively growth technique (Mannou col. 11, lines 30-37).

With regard to claim 16, Mannou et al. modified by Kunisato et al. in claim 10 above would disclose an etching stop layer 105 (Mannou fig. 1a).

Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mannou et al. (US 6,590,918) in view of Fujimoto et al. (US 6,242,761).

With regard to claim 17, Mannou et al. disclose an n-type GaAs current blocking layer formed on both side of the ridge part (fig. 1a), but do not disclose an insulation layer formed on the side of the ridge part. However, Fujimoto et al. disclose forming an insulation layer on the ridge part (Fujimoto fig. 7). Fujimoto et al. teach an oxide current blocking layer has higher efficiency than conventional device resulting a lower threshold current density (Fujimoto col. 4, lines 48-55). Therefore, it would have been obvious for the one with ordinary skill in the art to

modify Mannou's device with the teaching of Fujimoto et al. to provide an insulation layer on the side of the ridge part as a current blocking layer in order to have higher efficiency and a lower threshold current density.

Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mannou et al. (US 6,590,918) modified by Kunisato et al. (US 5,990,496) as applied to claim 10 above, and further in view of Yamamoto et al. (US 5,729,030).

With regard to claim 13, Mannou et al. disclose the semiconductor compound of the compound semiconductor layer 106 is made of AlInGaP, but do not disclose the compound semiconductor substrate is InP. However, Yamamoto et al. disclose the semiconductor structure is formed on an InP substrate (Yamamoto col. 7, lines 58-61). Yamamoto et al. teach the semiconductor structure should be lattice-matched with substrate and InP substrate having thermal stability and high reliability (Yammaoto col. 2, lines 44-58). Therefore, it would have been obvious for the one with ordinary skill in the art to modify Mannou's device with the teaching of Yamamoto et al. to provide an InP substrate in order to have a lattice-matched device and provide thermal stability and high reliability.

Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mannou et al. (US 6,590,918) in view of Takahashi (US 6,541,291).

With regard to claim 19, Mannou et al. do not disclose the semiconductor laser device could be integrated with an optical waveguide to form an optical amplifier or an optical modulator. However, Takahashi disclose a laser device incorporating a waveguide to form an

optical modulator (Takahashi col. 2, lines 18-21). Takahashi teaches the optical modulator propagates the laser light without inducing light loss and modulates with high efficiency (Takahashi col. 2, lines 30-36). Therefore, it would have been obvious at the time the invention was made to modify Mannou's device with the teaching of Takahashi to integrate the laser device with a waveguide to form an optical modulator in order to propagate the laser light without inducing light loss.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wai-Sing Louie whose telephone number is (571) 272-1709. The examiner can normally be reached on 7:30 AM to 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on (571) 272-1705. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

WSI
June 16, 2004.

LONG PHAM
PRIMARY EXAMINER